

Northwest Pipeline's Renewable Natural Gas Receipts Operating Policy and Testing Requirements

Northwest Pipeline's ("Northwest") Federal Energy Regulatory Commission Gas Tariff ("Tariff") states, pursuant to Section 3 of the General Terms and Conditions, all gas delivered to (i.e., received by) Northwest shall conform to the applicable gas quality specifications. Within this section, it furthermore states gas received by Northwest must be free of any substance which "interferes with the intended purpose of merchantability of the gas, or causes interference with the proper and safe operation of the lines, meters, regulators, or other appliances through which it may flow" ("Undesirable").

The following operating policy on Renewable Natural Gas ("RNG") receipts provides requirements for the acceptance of RNG into Northwest system and the actions required when RNG receipts exceed certain levels of constituents, listed in Table 3, that would render the RNG Undesirable. The constituents in the Table 3 are dependent upon the source of the RNG production. The three sources of RNG production are: (1) landfills, (2) dairies or feedlots, and (3) publicly owned treatment works, sewage treatment plants, or wastewater plant ("POTW").

- 1) Responsibility. The connected RNG facility will establish, maintain and administer a gas quality monitoring program with the knowledge and cooperation of Northwest to ensure that the RNG supplied by shippers meets or exceeds the requirements in Northwest's Tariff and the applicable constituent levels shown in Table 3 that would render the RNG Undesirable.
- 2) Initial Flow and Resumption of Flow Testing. The RNG producer/operator of the RNG facility ("RNG Operator") shall demonstrate before initial flow of RNG into Northwest's system, or after flow of RNG into Northwest's system has stopped for more than 30 consecutive days, that the RNG to be delivered meets or exceeds Northwest's gas quality specifications by providing test results ("Acceptable Test") from a third-party analytical laboratory approved ("Approved Laboratory") by Northwest and the RNG Operator ("Parties") using the procedures outlined in Section (3)(a)ii) below. The RNG Operator shall be responsible for all costs associated with such testing.
- 3) Procedure. The Parties will undertake the following procedures to ensure the quality of the RNG receipts:
 - a) Sampling. Sampling will be divided into two categories consisting of Continuous Sampling ("CS") and Periodic Sampling ("PS"). CS continuously ensures that the RNG supplied is pipeline quality gas and will take place at the Northwest RNG receipt point meter station ("Receipt Point"). PS is a secondary check to establish a baseline of gas quality and constituents, and RNG samples will be drawn from the process and analyzed by the Approved Laboratory.
 - i) Continuous Sampling. CS shall be performed by equipment which will be installed, operated, and maintained by Northwest. CS will be taken beginning at startup and commissioning of the Receipt Point and continuing until permanent disconnection of the Receipt Point on a continuous real time basis for the constituents listed in Table 1. The samples will be taken from a tap at the Receipt point.

Table 1 – Continuous Sampling	
Constituent	Method
Carbon Dioxide	In line Gas Chromatography
Oxygen	Optical or any industry approved method with required accuracy and lower detectable limit
Water	Tunable Diode Laser
Methane and BTU content	In line Gas Chromatography
Nitrogen	In line Gas Chromatography
Hydrogen Sulfide	Tunable Diode Laser or other technology with required accuracy and lower detectable limit
Temperature	In line Resistance Temperature Detector

- ii) Periodic Sampling. The RNG Operator shall procure and furnish all materials, equipment, supplies, services and labor required for PS extraction and analysis. RNG samples shall be extracted for laboratory analysis at a sample point upstream of the Receipt Point. The sample point will be an inline probe and will be separate from the sample point used for CS. Samples will be collected in Summa canisters for VOCs and permanent gases. Double samples will be drawn into Tedlar bags with non-metallic fittings for sulfur compounds, drawn as late in the day as permits overnight shipping in order to meet 24-hour hold times. Testing of samples in Tedlar bags received after 24-hour hold times may be accepted at the discretion of Northwest. Samples will be sealed and transported using established and customary sampling procedures. Samples will be sent by the RNG Operator to the Approved Laboratory for analysis. All test results will be shared with Northwest within five calendar days of the test results being received by the RNG Operator by sending the test results to Northwest's Gas Control Group. The RNG Operator shall be responsible for all costs associated with such testing.

After the initial flow or resumption of flow testing under Section (2), the PS sampling frequency will vary according to which of three phases of the project then applies. The phases consist of a Start Up/ Break-In/Commissioning phase lasting sixty (60) days after the first RNG is introduced into the pipeline system; an Initial Production Run phase lasting seven hundred and thirty (730) days following the end of the Startup/Break-In period; and a Mature Production Run phase encompassing the balance of the operational life of the meter station.

Sampling frequencies are approximate and may vary slightly based on production demands and availability. Table 2 shows the array PS frequencies.

	Start-Up/ Break-In Phase	Initial Production Run Phase	Mature Production Run Phase
A	Weekly	Every 180 days	Every 365 days
B	One Sample	Not Analyzed	Every 5 years

Table 3 shows the allowable RNG constituent levels, frequency and procedures to be used during PS. The RNG Operator shall provide notice to Northwest at least 48 hours in advance of scheduled gas sample extractions, in order to allow the Parties an opportunity to observe the procedure. No blending of the constituents shown in Table 3 will be allowed.

Constituent Class	Allowable Limit MG/m³ (ppm_v)	RNG Source			PS Freq	Sample / Test Procedure
		Land fill	Dairy	POTW		
Total Sulfur	Current Tariff	X	X	X	A	Tedlar bag/ ASTM D 5504
Biological,	Non-Detectible	X	X	X	A	Bio Cassette (EMLab P&K) API-RP38
Pesticides	Non-Detectible	X	X	X	A	PUF (GC/MD) EPA-10A
Radiation	Non-Detectible	X	X	X	B	PVC filter/ Alpha, Gamma Analysis
Siloxanes	0.4 mg Si/m ³	X		X	A	ASTM D8230, gas chromatography with atomic emission detection (GC-AED) or mass spectral detection (GC-MS)
Hydrogen	1000 ppm _v	X	X	X	A	Canister Collection, ASTM D1945, D1946
Ammonia	10 ppm _v				A	EPA 350.1 or equivalent
p-Dichlorobenzenes	57 (9.5)	X		X	A	Canister collection, EPA TO-14, TO-15
Ethylbenzene	260 (60)	X	X	X	A	Canister collection, EPA TO-14, TO-15
n-Nitroso-dinpropylamine	0.33 (0.06)	X			A	Canister collection, EPA TO-14, TO-15
Vinyl Chloride	8.4 (3.3)	X		X	A	Canister collection, EPA TO-14, TO-15

Methacrolein	11 (3.7)	X			A	Canister collection, EPA TO-14, TO-15
Toluene	9000 (2400)	X	X	X	A	Canister collection, EPA TO-14, TO-15

- b) Negative Results. If there are increases in the levels of detected Undesirable constituents, the RNG Operator shall provide written notification to Northwest of such increases. The sampling frequency for such constituents will be reset to the sampling frequency applicable to the previous phase until three (3) consecutive "Non-Negative" results are achieved with respect to such constituents. For instance, if a high result is noted during the Initial Production Run phase, then that constituent class will be sampled in accordance with the sampling frequency associated with the Startup/ Break-In phase until three (3) consecutive "Non-Negative" results are achieved.
- c) Changes. Changes to the RNG quality plan can be made by the RNG Operator as warranted to fit changing production needs and/or conditions at upstream facilities, provided that Northwest approves such changes in writing in advance of implementation.
- d) Special Tests. Northwest may request special testing at any time with reasonable advance notice if Northwest has a specific concern with the RNG quality plan or sampling results. The cost of such testing will be borne by RNG Operator if such testing demonstrates that the contaminant of special concern exists in concentrations above acceptable limits. If, after such testing, no such contaminants are found, or the contaminants are determined to exist in acceptable concentrations, then the cost of testing shall be borne by Northwest.
- e) Operational Issues. The RNG Operator shall develop and implement operational procedures and training programs that will include planned and emergency shut-down conditions and procedures to ensure that no low-quality RNG enters the Northwest interstate pipeline system. The RNG Operator shall make a copy of such operational procedures and training programs available to Northwest. Northwest shall have the option to require and witness a scheduled shut-down and an emergency shut-down exercise on an annual basis during the term of this Agreement. Such exercises shall be coordinated among the Parties, so as to minimize impact on facility operations.
- i) Additional Operating Requirements at Truck Unloading Interconnects. The RNG Operator shall develop and implement operational procedures and training programs for the safe connection and disconnection of trucks and to ensure that all air is purged from the RNG Operator's facilities prior to delivering RNG into the Northwest interstate pipeline system. The RNG Operator shall make a copy of such operational procedures and training programs available to Northwest. Northwest in its discretion and from time to time may require and witness scheduled connection, purging and disconnection exercises by the RNG Operator's truck driver(s). Such exercises shall be coordinated among the Parties, to minimize impact on facility operations. The RNG Operator will re-train any truck driver that is unable to complete such exercise in a safe and efficient manner.
- 4) This policy may be revised from time-to-time at Northwest's sole discretion as sampling and testing standards and methods evolve.
- 5) Northwest shall have the right to share all test results of the RNG.